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Reference 1

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Applicant: MAZDA MOTOR CORPORATION, Hiroshima (JP)

Title: METHOD FOR PRODUCING SUPPORTED METAL CATALYST

Claim:

1. A method for producing a supported metal catalyst, characterized by:

forming a metal support composed of a flat plate and a corrugated plate;

forming an alumina wash coat layer on the metal support;

impregnating a surplus wall part closer to the metal support in a thick wall part of the alumina wash coat layer formed at a corner part between the flat plate and the corrugated plate as well as a corner part of the corrugated plate with filler to suppress impregnation with a noble metal catalytic component; and

thereafter impregnating the alumina wash coat layer with the noble metal catalytic component.

Detailed Description of the Invention:

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[Problems to be solved by the Invention]

However, when alumina slurry is adhered as described above, plenty of alumina slurry gathers at a corner part A of a metal support to form a thick wall part of an alumina wash coat layer at the corner part A, so that the alumina wash coat layer 3A becomes relatively thin in a flat surface part B. Accordingly, such setting that a thick wall part is also impregnated with a required amount of catalytic component during the impregnation with the catalytic component results in a tendency of the high distribution density of the catalytic component in the flat surface part having the alumina wash coat layer 3A which is thin. As described above, there is such a problem that, when the density of the catalytic component becomes high, catalyst particles adjacent to each other are adhered to each other at high temperature to result in sintering (cohesion and coarsening), the surface area of the catalyst is thus reduced, and thereby catalytic activity is decreased.

In contrast, there is such a problem that appropriate setting of the distribution density of the catalytic component of the flat surface part of the alumina wash coat layer 3A results in relative decrease in the distribution density of the catalytic component in the thick wall part of the alumina wash coat layer 3A.

The present invention is aimed at providing a method for producing a metal support catalyst for purifying exhaust gas, wherein a catalytic component with which an alumina wash coat layer is impregnated is uniformly distributed and has a proper

amount, so that the catalytic activity thereof can be enhanced.

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[Operation]

In a method for producing a supported metal catalyst according to the present invention, a surplus wall part closer to a metal support in a thick wall part of an alumina wash coat layer formed at corner part of the metal support is impregnated with filler (such as polyvinyl alcohol) to suppress impregnation with a noble metal catalytic component as described above, and therefore the surplus wall part impregnated with the filler loses the function of impregnation with a catalytic component as the alumina wash coat layer, so that the overall thickness of the substantial alumina coat layer which can be impregnated with the catalytic component becomes uniform.

Accordingly, the impregnation with the catalyst component based on the alumina wash coat layer having the uniform thickness allows the proper and uniform distribution of the catalyst component on the overall alumina wash coat layer.

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Examples of the method for producing the supported metal catalyst are described below.

In a first step, a metal corrugated plate 1 was held

between two metal flat plates 2, and the abutments of the corrugated plate 1 and the flat plates 2 were joined to produce a metal support.

In a second step, an alumina wash coat layer was formed on the metal support.

In this step, 1.6 cc of nitric acid were added to 80 g of γ-alumina, 20 g of CeO_2, 100 g of boehmite and 240 cc of water, and the mixture was stirred to produce alumina slurry. A metal support beforehand burnt in air at 1,000°C for 6 hours was immersed in the alumina slurry, and thereby the alumina slurry was adhered. The metal support to which the alumina slurry was adhered was subjected to air blow to remove surplus slurry, thereafter dried at 150°C for 30 minutes, accommodated in a baking furnace and burnt at 550°C for 1.5 hours to produce a metal support having an alumina wash coat layer 10.

In a third step, a surplus wall part 3a closer to the support in a thick wall part of the alumina wash coat layer 3 at the corner parts between the flat plates 2 and the corrugated plate 1 as well as the corner parts of the corrugated plate 1 was impregnated with $(-CH_2C(OH)-)_n$ (polyvinyl alcohol) as filler.

In this step, 200 cc of water were added to 50 g of polyvinyl alcohol, the mixture was stirred to produce a polyvinyl alcohol solution, and the metal support having the alumina coat layer 10 was immersed in this solution, followed by being washed with water, subjected to air blow to remove a

surplus polyvinyl alcohol solution, and dried at 200°C for 2 hours.

The majority of polyvinyl alcohol in the part except the surplus wall part 3a of the alumina coat layer 3 was removed by the above-mentioned washing with water, air blow and drying, and polyvinyl alcohol in an impregnation state remained in the surplus wall part 3a.

In a fourth step, the alumina coat layer 3 was impregnated with a metal catalytic component.

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As filler with which the surplus wall part 3a is impregnated, which are not limited to the above-mentioned polyvinyl alcohol, various other synthetic resinous materials, starches and the like can be also used. It is essential only that the filler be material with which the alumina coat layer 3 can be impregnated and be such material that the materials with which the part of the alumina coat layer 3 except the surplus wall part 3a is impregnated can be removed at a heating temperature of about 100-200°C.